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The Functional Analysis of Ward Plans

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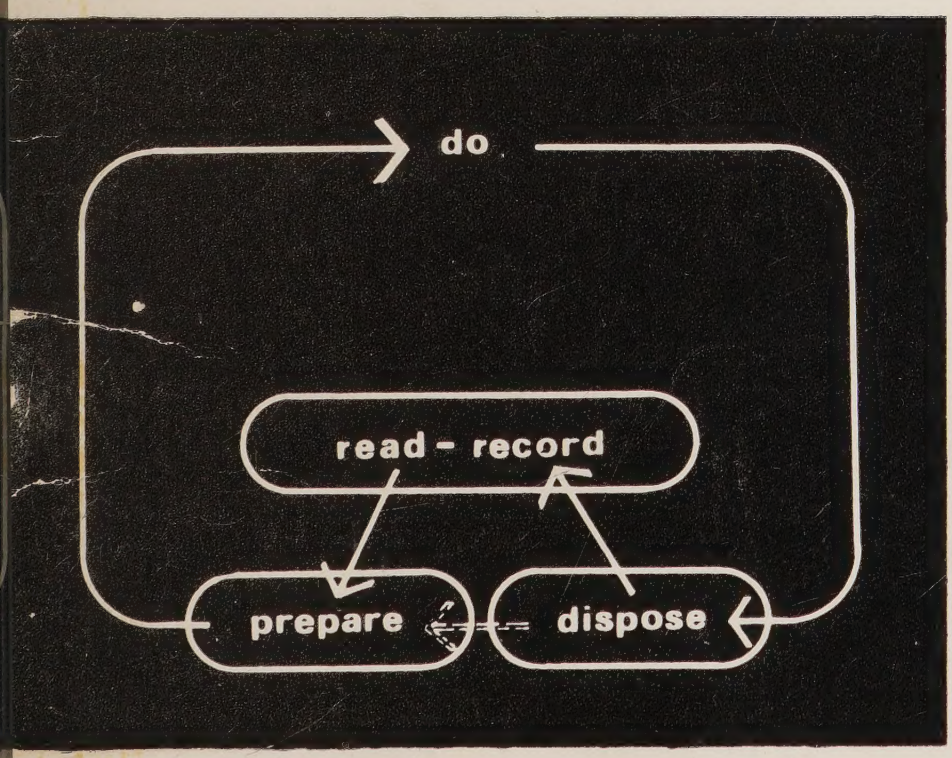

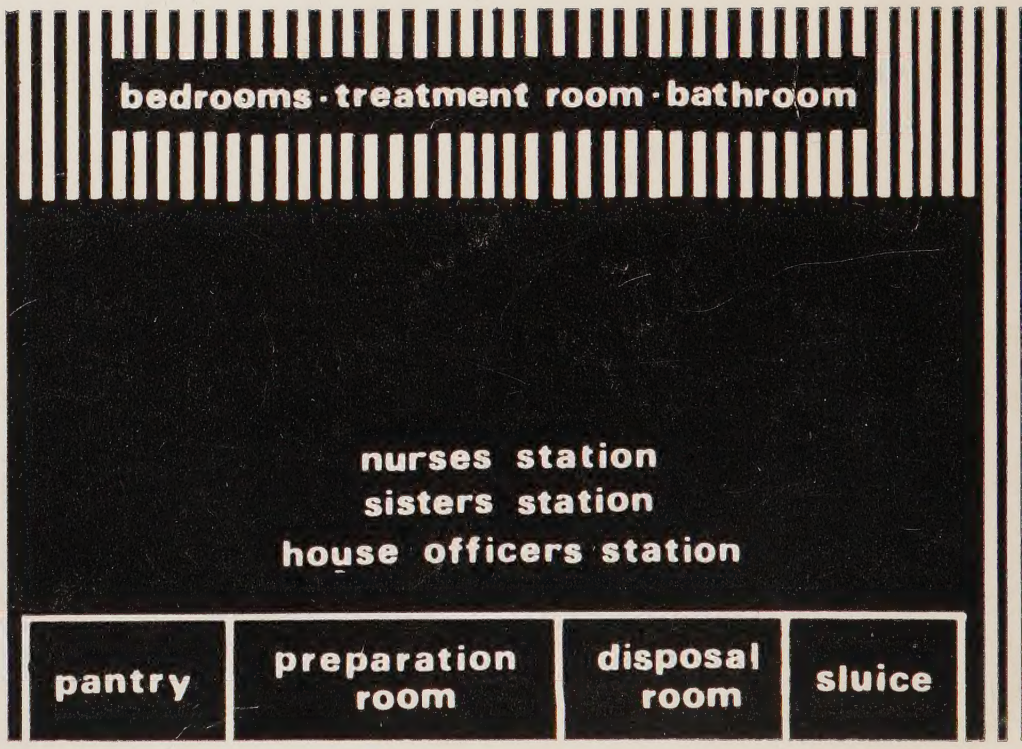

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THE FUNCTIONAL ANALYSIS OF WARD PLANS

1 INTRODUCTION

1.1 This document seeks to provide a guide to the objective analysis of ward plans. The general philosophy which underlies comments in the text is based on the analysis of ward function contained in the Scottish Home and Health Department Planning Note No. 1 " Ward Design," on experience gained in studies undertaken from this Centre, and detailed discussion with the planners of particular projects.

1.2 It must be stressed at the outset that a systematic approach is essential in making a functional analysis of any ward plan and that the satisfactory grouping of rooms and the relationship of these groups one to another are of cardinal importance. As much confused thought is still apparent, this paper attempts to set down concisely the main planning criteria applicable to an acute ward in a general hospital. If these basic requirements are not satisfied, it may be predicted with confidence that the ward will not work well regardless of other considerations.

1.3 It should be noted that good design in itself need not involve more expense; it is only the provision of extra accommodation and services which costs more. Good groupings of rooms should not cost more than poor groupings. It is recognised that ward plans will have to be looked at from other points of view, *e.g.* how economical in terms of area, relationship of bed/ancillary/circulation space, and requirements of fire precautions. It should be stressed, however, that these points should be considered only after the basic functional groupings have been achieved. As the design develops in more detail, other, more technical points, not necessarily apparent in the sketch plans, have to be examined, *e.g.* daylighting, artificial lighting, engineering services, floor coverings and other finishes.

2 BASIC REQUIREMENTS

In the analysis and assessment of a ward plan, the effect of certain basic policy requirements, which ought to form part of the architect's brief, should be considered. These include:—

2.1 **The size of each nursing charge**

It is important to establish the exact size of each nursing charge shown on the plan in order to assess the convenience of the nurse-working areas to the bed areas which they serve. In a standard acute ward a charge of 30 beds is the accepted optimum which can be served by one nursing team using one set of ancillary rooms. Smaller, self-contained charges are only economic in staff and facilities for highly specialised work.

2.2 **The number of beds in the ward unit and, arising from this, whether the ward plan represents the whole or part of one floor**

It should be established whether the plan represents a self-contained ward unit or whether it shares accommodation with another unit either on the same or another floor. There is an advantage in nursing charges being so grouped as to form a suitably integrated charge for an administrative sister. At Appendix 2 Plan A illustrates the sharing of a substantial amount of accommodation between two ward units. Plan B shares only a corridor between two nursing charges and Plan C represents a self-contained 30-bed unit on one floor.

2.3 **The policy as regards intensive therapy and intensive nursing care**

In order to make the best use of nursing staff and of equipment, it is important to group acutely ill patients in special areas which should be self-contained units with their own sets of ancillary rooms. A table giving the salient differences between the two types of accommodation is given at Appendix 1. It will be realised that one advantage of a ward floor comprising two ward units is that it will justify the provision of a purpose-designed and equipped intensive nursing care area under the same nursing administration as the rest of the ward floor. Another advantage is that since the load on the intensive nursing care area is variable, the accommodation can expand and contract between this area and the two intermediate care areas as necessary.

2.4 **The number of single rooms, of multi-bed rooms, and the number of beds to be accommodated in each multi-bed room**

2.4.1 In recent planning 20% to 25% of beds in single rooms have been regarded as an average requirement for patients needing privacy, isolation or segregation. A substantial increase in the number of single rooms would increase both nurse walking distances and the level of nurse staffing required.

2.4.2 The remainder of the beds can best be provided in four-bed rooms to allow for a satisfactory level of privacy and amenity. This ensures that each patient occupies a " corner " situation and therefore has one side of his bed free from another patient. This type of provision facilitates a more open policy as regards visitors.

2.4.3 The reduction in nurse walking distance obtained by having six-bed rooms instead of four-bed rooms is not sufficient to affect nurse staffing levels, and the reduced corridor length is offset to some extent by the increased room depth. Large multi-bed rooms in acute wards for adults represent a significant loss of amenity and of flexibility in the allocation of beds. They can be justified only on grounds of economy.

2.5 **Whether the plan is intended to promote a high degree of flexible usage between sexes and specialties**

The development of new sub-specialties, changes in the pattern of morbidity, and the need to maintain a high bed occupancy rate accentuates the importance of accommodation designed to be flexible in use. This flexibility can be effectively achieved by the provision of single rooms and four-bed rooms. These rooms must be as self-contained as possible and, in particular, should be directly linked to W.C. and washing facilities. Decentralised day space also contributes an element of flexibility.

2.6 **The central services to be provided, e.g. sterile supplies, dish-washing, linen, food**

It has now become established that wherever possible centralised services should be provided with the consequent removal of many unnecessary activities at ward level. The range of central services provided will affect the location and size of some of the working areas.

2.7 **The supply and disposal system**

The frequency of distribution and collection of supplies, the types of containers and methods of storage will all affect the size of rooms used for storage. In order to reduce the amount of nurse walking, it is essential to concentrate the storage of supplies—clean and dirty—in as few places as possible within a ward unit.

3 MAIN GROUPINGS

After these basic requirements have been considered certain main groupings of areas and facilities within the defined nursing charge should be studied in relation to their functions. The essential groupings and relationships are:—

3.1 Bed areas to one another

Bedrooms should be grouped as compactly as possible to minimise nurse walking distances and should not be separated by non-patient areas, *e.g.* staff rooms. Reference to Appendix 2 will show that Plans A and B have a similar degree of compactness as regards bed areas, though Plan B has a corner which may involve some inconvenience in practice. Plan C shows a group of non-patient areas—offices, stores, and the ward entrance—separating groups of beds which are likely in practice to compose a single nursing charge.

3.2 Intermediate care bed-areas to intensive nursing care bed-areas

Intensive nursing care will not be required on every ward floor, but where one is provided it should be so located that the beds can be grouped on a flexible basis with the adjacent intermediate care area when not required for intensive nursing care. This is necessary because of the fluctuating demand. Plan A shows two 30-bed nursing charges on one ward floor with a self-supporting intensive nursing care area directly related to each and including a substantial element of flexibility in use. Plan B shows a 60-bed layout in two distinct units which do not allow either two separate or one combined self-supporting intensive nursing care area. In Plan C no allowance is made for intensive nursing care other than the use of single-bed rooms.

3.3 Single rooms to multi-bed rooms

A proportion of the total number of single rooms should be allocated to the intensive care area and the remainder to the intermediate care area.

3.4 Nurse-working areas to bed areas

To facilitate the nurses' work certain rooms should be grouped together to form the nurse-working area. This area is described in detail in paragraph 4. It is essential that this group be so located as to provide short walking distances between it and the bed areas which it serves. This also applies in an intensive nursing care area.

3.5 Nurses', Sister's and House Officer's station to bed areas

These three stations should be grouped together and provide a centre for the giving or receiving of instructions and for the recording of procedures. The patients' record trolley should be accessible to all three stations. These three stations should be centrally placed in relation to the bed areas. In the intensive nursing care area it is essential to provide direct observation from the stations to the beds. But this requirement is less important in the intermediate care area than was previously supposed.

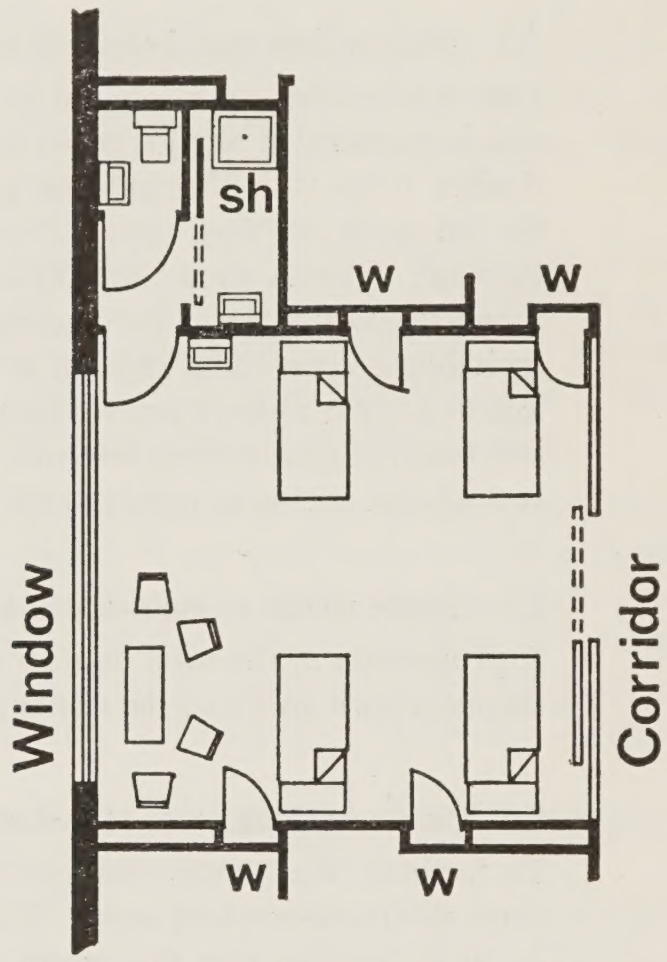
3.6 W.C. compartments, washing and showering facilities to bed areas

To improve amenity and allow flexibility in use of the ward unit, these should communicate directly with the bed areas which they serve. Direct access to a W.C. from the bed area, without entering a ward corridor, will encourage their use when otherwise a bed-pan would be required. Plan A demonstrates

this at all bed areas. Plan B makes no such provision—Plan C provides it for single rooms only. In geriatric and certain psychiatric units where some patients have to be escorted and supervised, it might be better to plan them centrally.

3.7 Day rooms to bed areas

Within each multi-bed room a small sitting area should be provided to meet the requirement of early ambulation, to improve the level of privacy, and to facilitate flexibility in use. A central dayroom (or rooms) of a domestic character should also be provided for the convenience of the more ambulent patients. Plan A meets both these requirements. Plans B and C have a large central day/dining space.



3.8 Storage space for patients' clothing to bed areas

There is a definite advantage in storing each patient's clothing in a wardrobe cupboard within his cubicled bed area. It encourages early ambulation, improves security, and can even improve bed turnover by removing delays due to patients' clothing not being immediately available.

3.9 Treatment room and bathroom to nurse-working areas

This relationship is the same as for the bed areas in that they are patient-care areas and not routine nurse-working rooms.

3.10 Other supporting rooms

Offices, interview and overnight stay rooms, laboratory, staff cloaks, domestic service room and equipment stores are examples of rooms required at ward level but not related to any particular group. They may, indeed, serve more than one nursing charge. Their location should not be allowed to interfere with any of the above groupings.

4 NURSE-WORKING AREAS

4.1 The rooms comprising the nurse-working area are a most important group and their relationship one to the other should be carefully examined. Analysis of nursing procedures in wards shows that all procedures conform to one broad pattern made up of a number of activities. These activities are:—

Read: giving and receiving verbal or written instructions

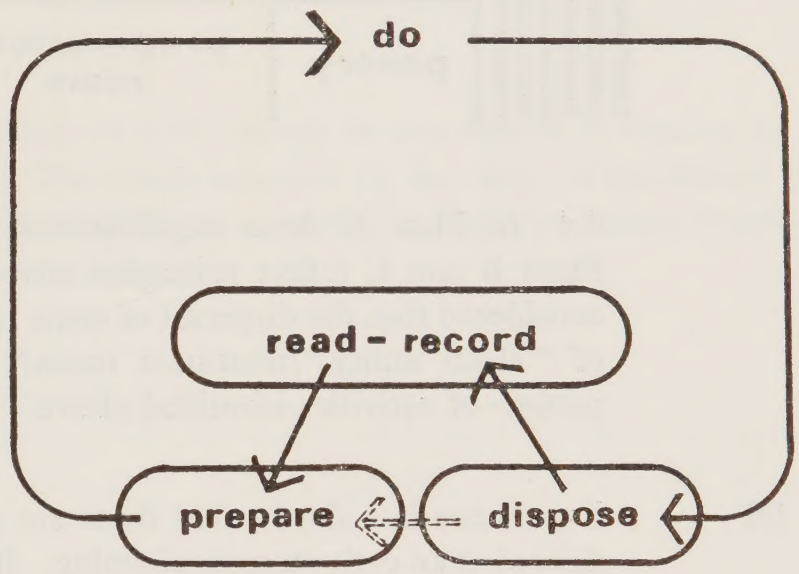
Prepare: preparation or collection of items for nursing procedures

Do: carrying out the procedure in the bed areas, treatment room or bathroom

Dispose: cleaning or disposal of used items

Record: recording results of the procedure

These activities can be shown diagrammatically thus:—



4.2 The activities described above require the following accommodation:—

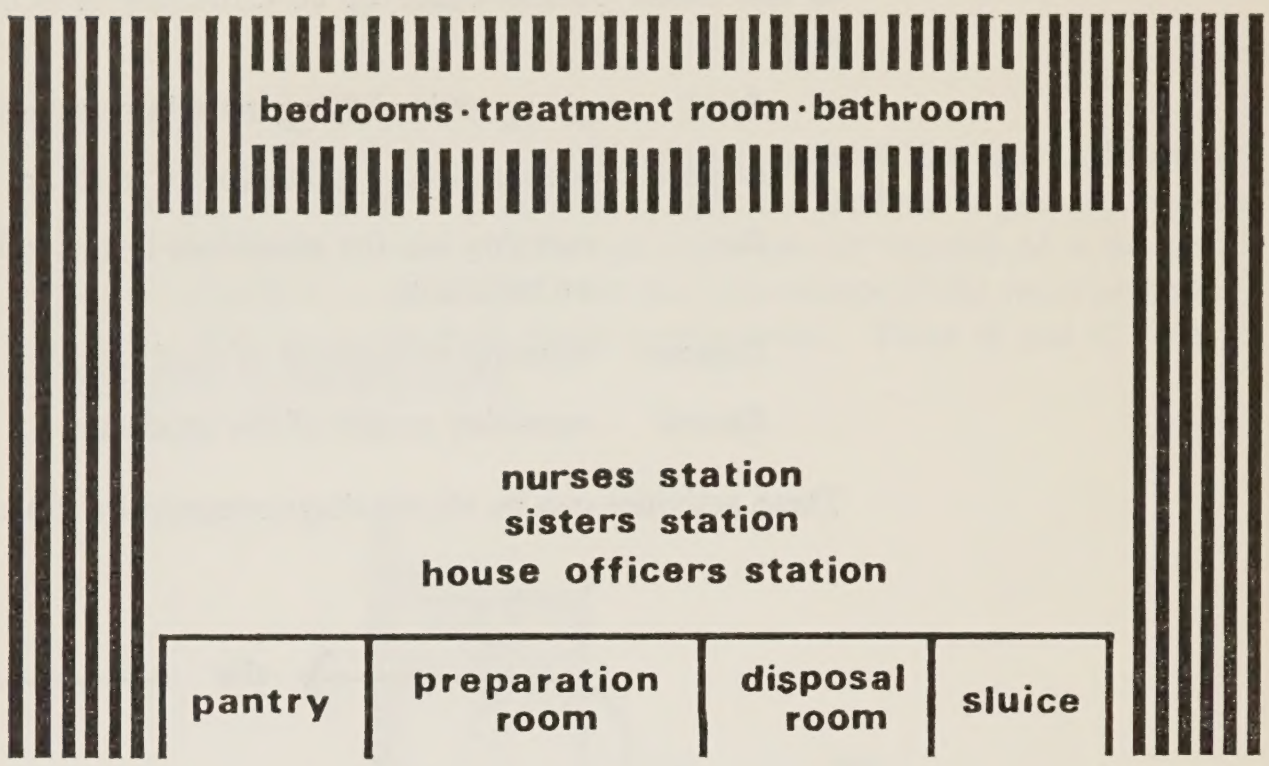
4.2.1 *Instructions area.* This area consists of the nurses' station, sister's station and the house officer's station. They should be grouped with shared access to the patients' records.

4.2.2 *Preparation area.* The preparation area for procedures consists of the preparation room and the ward pantry. All clean and sterile items for nursing and medical procedures should be selected and assembled in one preparation room. This includes linen and drugs. Sufficient space must be provided for trolley setting. The beverage pantry has a slightly different preparation function. This should be located next to the preparation room.

4.2.3 *Disposal area.* A disposal room is required for the temporary storage of used items awaiting disposal, destruction, or reprocessing. A small number of items are reprocessed in this room and returned to the preparation room, *e.g.* treatment trolleys.
Adjacent to this room a separate sluice room should be located for the disposal of excreta. The collection and testing of specimens can also be done here.

4.2.4 *Recording area.* This is again the nurses' station, sister's station and house officer's station where the results of procedures are recorded.

4.3 The following diagram illustrates the above grouping of the nurse-working area to other areas in the ward unit:—



4.4 In Plan A these requirements have been understood and satisfied. Plans B and C reflect principles advocated by 1956 Nuffield Report. It is considered that the dispersal of some rooms and the " en suite " arrangement of " clean utility "/treatment room/" dirty utility " do not encourage the pattern of activities identified above.

5 POINTS OF DETAIL

Experience has shown that there are points of detail which should be considered at an early stage in planning. If not, there is a danger that they cannot be adjusted later and a loss of functional efficiency may result. This is more often related to the shape than to the size of a particular room or area. Important points are:—

5.1 Observation/privacy

Some compromise is necessary between the degree of privacy the patient can be afforded and the amount of nurse observation required. This can be effectively obtained by a full width, glazed panel at a sill height of 4′–3″, along the corridor wall and across the ward door. This is provided in Plan A which also shows sanitary facilities for each multi-bed room without impairing observation from the ward corridors. The open-bay arrangement as shown in Plans B and C fails to provide privacy. The extent of observation provided in Plan C is limited in Plan B by the location of patients' wardrobes. In Plan A the wardrobes are provided next to the bed heads.

5.2 Shape of rooms and areas

5.2.1 *Single-bed rooms.* There should be a minimum of 11 ft. from wall to wall on the long axis of the bed.

5.2.2 *Equipment rooms, domestic service rooms and wheelchair and sanichair base.* Broad and shallow or square rooms should be provided. Long narrow rooms lead to difficulty in gaining access to equipment.

5.2.3 *W.Cs.* The shape of room must allow easy access for sanichairs and the provision of a washhand basin. The door should open out-

wards. When the door is shut the compartment should be enclosed from floor to ceiling.

5.2.4 *Washing compartments.* These should be separate from W.C. compartments, self-contained, and, though the walls need not necessarily extend from floor to ceiling, doors should be provided. Some of the washing compartments should allow easy access for wheelchairs.

5.3 Engineering Services

An assurance should be obtained that, having agreed to a shape, size and grouping of rooms, these will not be prejudiced at a later stage by the inclusion of ducts or the siting of radiators.

5.4 Provision for clothing storage

The location of storage for patients' clothing etc., may have an important effect on amenity for patients and their relatives, nurses' work, nurse/patient observation, and on the design of partition walls. It is desirable that this storage should be located next to each patient's bed.

5.5 Doors

The type and size of door should be considered in relation to the function of each room. The space required by the door swing should be takenin to account and the possible value of sliding doors in certain situations should be considered.

APPENDIX I

INTENSIVE CARE

INTENSIVE NURSING CARE

Nurses
24 hour nurse staffing.

Doctors
Doctors on call.

Patients
12%-20% of patients on an acute ward. This amounts to 8-12 beds in a 72-bed floor.

Admission and Dismissal
Admission to and dismissal from the unit on nursing decision.

Equipment
Type of equipment used is controlled and operated by nursing staff, *e.g.* drainage apparatus, I.V. apparatus.

Staff
Interchangeability of staff possible with nurses in other units on same floor, *e.g.* intermediate care units.

Co-ordination of Patient Care
Good co-ordination of patient care if unit is on ward floor and under the supervision of administrative sister responsible for all the bed areas.

Location
On each " acute " ward floor.

Ancillary Rooms
The essential " nurse-working " rooms, *e.g.* preparation and disposal rooms, should not be shared with any other bed area on the same floor.

INTENSIVE THERAPY

Doctors
24 hour medical staffing.

Nurses
24 hour nurse staffing.

Patients
1%-2% of total number of patients in acute wards in the hospital. This amounts to 6-10 beds in a 600-800 bed hospital.

Admission and Dismissal
Admission to and dismissal from unit on medical decision.

Equipment
Controlled and operated by medical staff and technicians, *e.g.* ventilators.

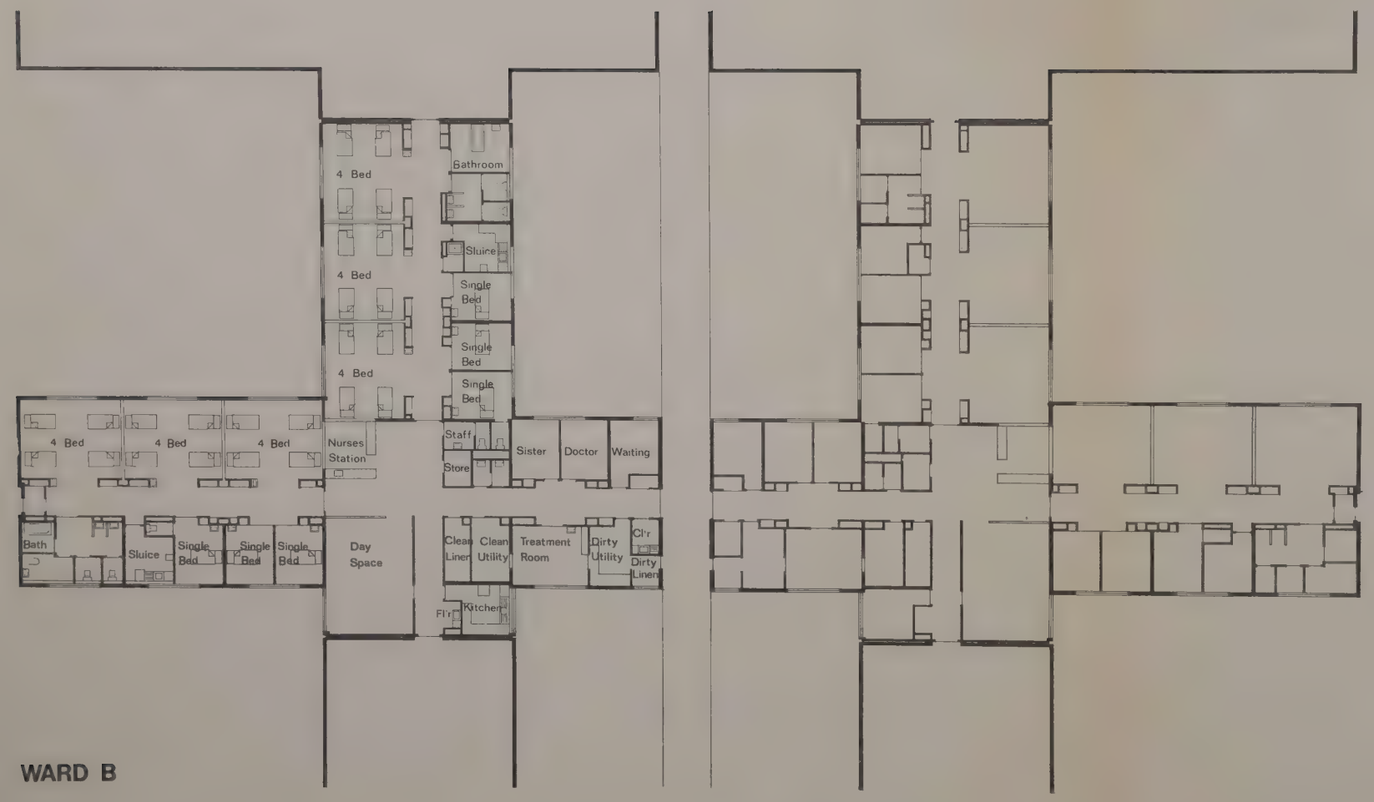
Staff
Separate staff. No interchangeability with staff on other units.

Co-ordination of Patient Care
Patients require to be passed to other nursing team on dismissal from unit for continuation of their care. This leads to more difficult co-ordination of care.

Location
One unit for whole hospital and located adjacent to, but **not** part of, the operating theatre suite.

Ancillary Rooms
A separate set of ancillary rooms should be provided for the unit.

WARD A



WARD B

WARD C

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